CITY OF KIRKLAND
123 FIFTH AVENUE ● KIRKLAND, WASHINGTON 98033-6189 ● (425) 587-3800

DEPARTMENT OF PUBLIC WORKS
PRE-APPROVED PLANS POLICY

Policy R-13: INTERSECTION SIGHT DISTANCE

Sight Distance at Intersections

1. General – These guidelines establish the sight distance triangle that must be kept clear of sight obstructions for all intersections and driveways pertaining to new developments. They are also applicable to the investigation of sight-distance complaints at existing intersections and driveways. The sight distance triangle depends primarily on the required visibility at the intersection or driveway. It is determined by the type of intersection control (stop sign, traffic signal or no control) and the speed limit on the major road or street entered upon. In the following sub-sections, the sight distance requirements used to properly establish sight distances triangles at various types of intersections and driveways are presented. Table 2 on page 2 lists recommended (desirable) and minimum (required) sight distances values and Figures 1, 2, 3a and 3b on pages 5 through 7 show corresponding sight distance triangles.

2. Types of Intersections and Driveways. – Table 1 below summarizes the characteristics of various types of intersections and driveways.

TABLE 1: Types of Intersections and Driveways. Use this table to determine type (A through F)

All cases except driveways			
Type	Average Daily Traffic (ADT) on Major Street or Street Entered Upon.	Control Type	Speed Limit (MPH) on Major Street or street entered upon.
A	< 1000	None	25
B	Any	Stop sign	Any
C1	< 1000	Yield (four legged intersection)	25
C2	< 1000	Yield (T intersection)	25
D	Any	Signal	any
F	Cases not covered by Types A through D		
Driveways (includes vehicular access easements and tracts)			
Type	Driveway PM Peak Volume	Major Street Average Daily Traffic	
E1	<10	<6000	
E2	10 ≥ and < 50	Any	
E3	50 ≥ and ≤ 200	Any	
E4	> 200	Any	
F	Cases not covered by Types E1 through E4		

3. How to Establish Sight Distance Triangles– Sight distance triangles for various types of intersections and driveways are shown in **Figures 1, 2, 3a and 3b** on pages 5 through 7. In these figures, the sight distance triangles are represented by the shaded areas. Point A, or driver's decision point, represents the location of the driver; Point B is located on the major road at a specific distance (to the right and to the left) from the driver. This distance, referred to as the required sight distance, represents how far (on the major road) the driver should be able to see so as to safely exit a minor road or driveway or to make a right turn on red at a signalized intersection. **Table 2** on page 2 shows (in the right most columns) the sight distances values that need to be used to determine the sight distance triangle at various types of intersections and driveways.

   For **uncontrolled intersections** (no traffic light, stop sign or yield sign described in **Type A/Figure 1)** or a **yield controlled intersection** described in **Type C/Figure 3a**, contact **Iris Cabrera**, City Transportation Engineer, at **425-587-3866** to have the Public Works Department determine the required sight distance triangle.

TABLE 2: Sight Distance Triangle Guidelines

Type of Intersection / Driveways	Distance from Edge of Traveled Way (ft)	Major Street (Street Entered Upon)			
		Average Daily Traffic	Speed Limit (MPH)	Sight Distance Value (ft) (a) (B-C1) and (B-C2)	
				Recommended (Desirable)	Minimum (Required) (d)
A – Uncontrolled (See Figure 1)	115 (b)	<1000	25	115	115
B - Stop Control on Minor Street (See Figure 2)	14	Any	25	280	150
			30	335	200
			35	390	250
C - Yield Sign On Minor Street					
C-1: Four-Legged Intersection (See Figure 3.a)	130 (c)	<1000	25	295	295
			30	355	355
			35	415	415
C-2: T- Intersection (See Figure 3.b)	80 (c)	<1000	25	295	295
			30	355	355
			35	415	415
D – Signalized Intersection (See Figure 2)	14	Any	25	240	150
			30	290	200
			35	335	250
E1 – E4 Driveways (See Figure 2)					
E1 (<10 PM Peak Trips)	10	<6000	25	150	150
			30	200	200

E2 (10-49 PM Peak Trips)	14	<6000	25	150	150
			30	200	200
			35	250	250
		>6000	25	280	150
			30	335	200
			35	390	250
E3 (50-200 PM Peak Trips)	14	<6000	25	150	150
			30	200	200
	14	>6000	25	280	150
			30	335	200
			35	390	250
E4 (>200 PM Peak Trips)	14	<6000	25	280	150
			30	335	200
	14	>6000	25	280	150
			30	335	200
			35	390	250

Footnotes:
(a) These values should be adjusted for grades with slopes of a magnitude of grade greater than 3%, number of lanes greater than two, for skewed intersections or for design vehicles other than passenger cars, using the intersection sight distance procedures in Chapter 9 of a Policy on Geometric Design, AASHTO, 4th Edition
(b) Distance back from center of intersection.
(c) Distance back from point C1 or C2 for types C-1 and C-2 intersections.
(d) Minimum (Required) only permitted if Recommended (Desired) is not possible (see page 3 for further explanation).

a. The values in **Table 2** on page 2, referred to as **Recommended (Desirable)** sight distance are based on the intersection sight distance procedures in Chapter 9 of A policy on Geometric Design, AASHTO, 4th Edition.

b. The values on **Table 2 on** page 2, referred to as **Minimum (Required)** sight distance are based on the stopping sight distance values in Chapter 3 of A policy on Geometric Design, AASHTO, 4th Edition.

c. The difference between the values in **Recommended (Desirable) and Minimum (Required)** above is important. Wherever reasonably feasible, the **Recommended** values should be used. This is typically the case in new construction. Only when the **Recommended** values cannot be reasonably achieved should the **Minimum** values be considered. It is important that every reasonable effort be used to make **Recommended** sight distance available, but it is understood that in some cases the difficulty in doing so is unreasonably disproportionate to the benefits gained. If less than the **Recommended**, but more than the **Minimum** can be provided, the distance provided should be maximized.

d. To determine the **Average Daily Traffic for Intersections A, B, C, C-1, C-2 and D**, see the Traffic Count Summary attached to the instructions (see Attachment 2), or the "Sight Distance Procedures" section in the Public Works

home page on the City's web site at www.kirkland.wa.gov go to City Departments (blue tabs on left side), Public Works (listing on right side), Transportation and Streets (blue tabs on left side), Streets, Sight Distance Procedures.

e. To determine the **Average Daily Traffic for Driveways E1 through E4**, use the PM Peak Trips Calculation Spreadsheet under the "Sight Distance Procedures" section in the Public Works home page on the City's web site at www.kirkland.wa.gov (go to City Departments (blue tabs on left side), Public Works (listing on right side), Transportation and Streets (blue tabs on left side), Streets, Sight Distance Procedures). Using the spreadsheet, insert the size of the project and the formula will calculate the average daily trips for the use(s) on the subject property.

4. Permissible Intrusion in the Area To Be Kept Clear of Sight Obstruction

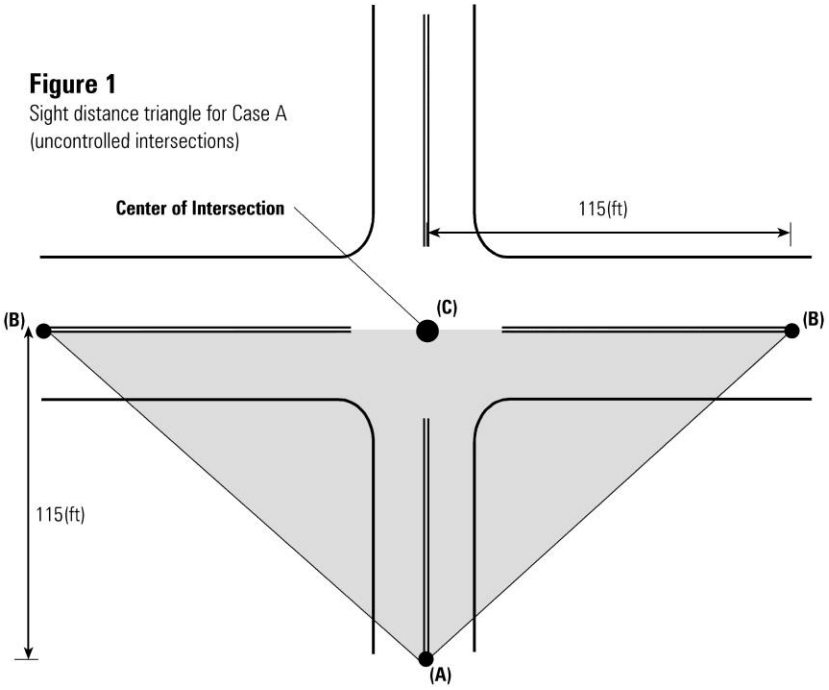
a. General – Except as stated in subsection (4)(b) of this section or unless specifically approved by the Public Works Director, no structure, improvement, vegetation or other objects may be within the area to be kept clear of sight obstructions between three (3) feet and eight (8) feet above the elevations of the pavement edge of each intersecting street, private driveway, or vehicular access easement or tract where that street, driveway or vehicular access easement or tract meets the points of the triangle that form this area furthest away from the intersection.

b. Exceptions – The following are permitted to be within the area that must be clear of sight obstructions:

Natural and fabricated objects and natural topography of the ground if the Public Works Director determines that adequate visual access is available. However, to fulfill the intent of this section, the Public Works Director may require land surface modification as part of any development activity on the subject property.

Type A – Uncontrolled Intersections

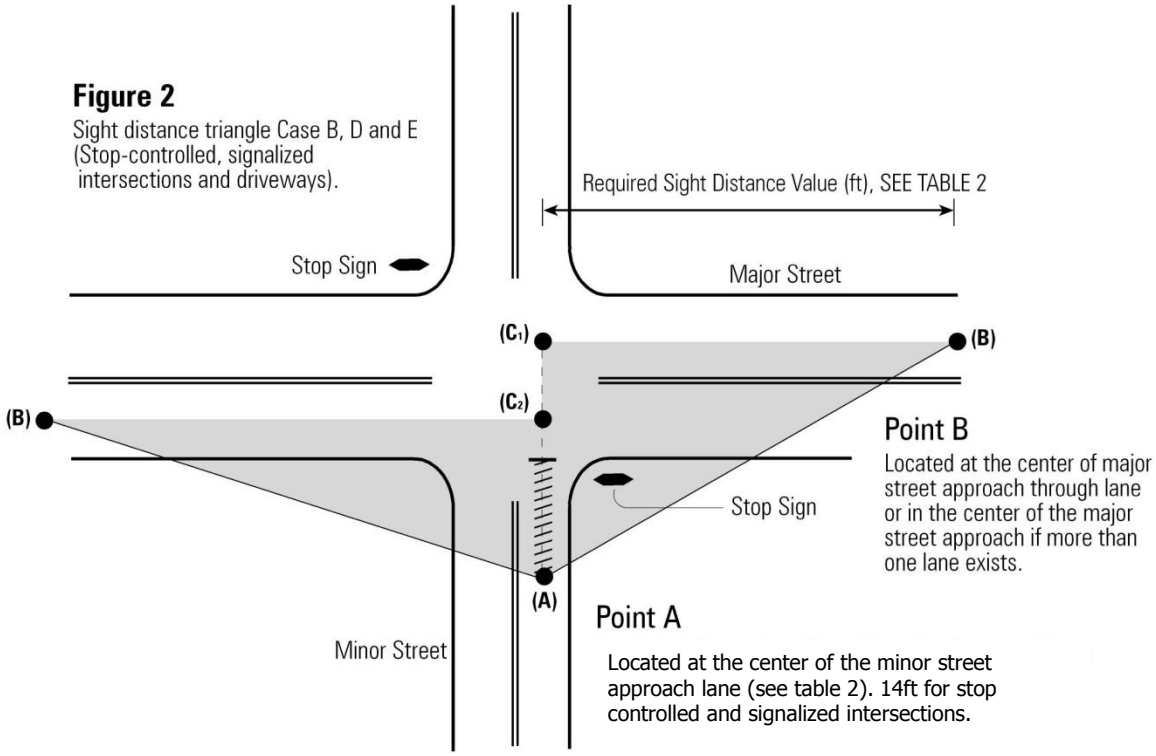
Uncontrolled intersections are not controlled by either stop or yield signs. They are usually located on streets that carry very low volumes and have a 25 MPH speed limit. Figure 1 below shows the sight distance triangle for this type of intersection. In this Figure, Point A and point B are each located on the center of the intersecting street approaches, 115 ft from Point C, which is located at the center of the intersection. The sight distance triangle area that must be kept free of sight obstructions is the shaded area limited by segments AC, BC and AB.



Type B – Stop Controlled Intersections

Type B intersections are those at which the minor street approaches are controlled by stop signs. Sight distance triangle to the left is the shaded area bounded by segments A-B, B-C2 and A-C2; whereas sight distance triangle to the right is the shaded area bounded by the A-B, B-C1 and A-C1 segments as shown in Figure 2 below. Point A, or decision point, is located in the center of the minor street approach lane, 14 ft. from the edge of the major road's traveled way**. The traveled way is the portion of the road intended for the movement of vehicles and bicycles, exclusive of shoulders and turning lanes.** Point B is located on the center of the through lane on the major street (or in the center of the major street approach if more than one lane exists), a specific distance left and right from Points C1 and C2. The distance C1-B (same as C2 –B) is the required sight distance, which can be found in Table 2 on page 2.

Although it is not typical to do so, if a parking lane exists on the major street, it may be excluded from the traveled way in special cases. Usually these are cases where volumes and speeds are low and therefore the overall safety risk at the intersection is considered low.



Type C – Yield Controlled Intersections

Two sight distance triangles need to be considered for Yield-controlled intersections: approach and departure sight distance triangles**. The approach sight distance triangle is the area that must be free of obstructions that may block an approaching vehicle's view of potentially conflicting vehicles**. **The departure sight distance triangle is the area that must be clear of obstructions that may block the view of a stopped vehicle.** These sight distance triangles are shown in Figures 3a and 3b on page 7 respectively for Types C-1, Yield-controlled Four Legged and C-2, Yield-controlled T intersections.

Figure 3a shows the approach sight distance triangles in dark shade and the departure triangle in light shade. Within the approaching sight distance triangle Point A is located in the center of the minor street approach lane, 130 ft from Point C1, which is located at the center of the major street approach lane. The driver should be able to clearly see from Point A, a distance equal to 25 ft from C1. At Yield –controlled T intersections (shown in Figure3b) on page 4, the recommended distance from Point A to C1 is 80 ft.

The departure sight distance triangle (shown as the light shaded area) at both types of yield controlled intersection is similar to the sight distance triangle at stop controlled intersections (Type B above on page 3) The driver's decision point or Point A is located in the center of the minor street approach lane, 14 ft. from the edge of the major road's traveled way. The **traveled way is the portion of the road intended for the movement of vehicles and bicycles, exclusive of shoulders and turning lanes.** Point B is located on the center of the major street approach through lane (or at the

center of the major street approach if more than one lane exists), a specific distance to the left and to the right of Points C1 and C2. This distance is the recommended sight distance, which can be found in Table 2 on page 2.

Although it is not typical to do so, if a parking lane exists on the major street it may be excluded from the traveled way in special cases. Usually these are cases where volumes and speeds are low and therefore the overall safety risk at the intersection is considered low.

Figure 3a
Sight distance triangle for Case C-1(4-legged yield controlled intersection.)

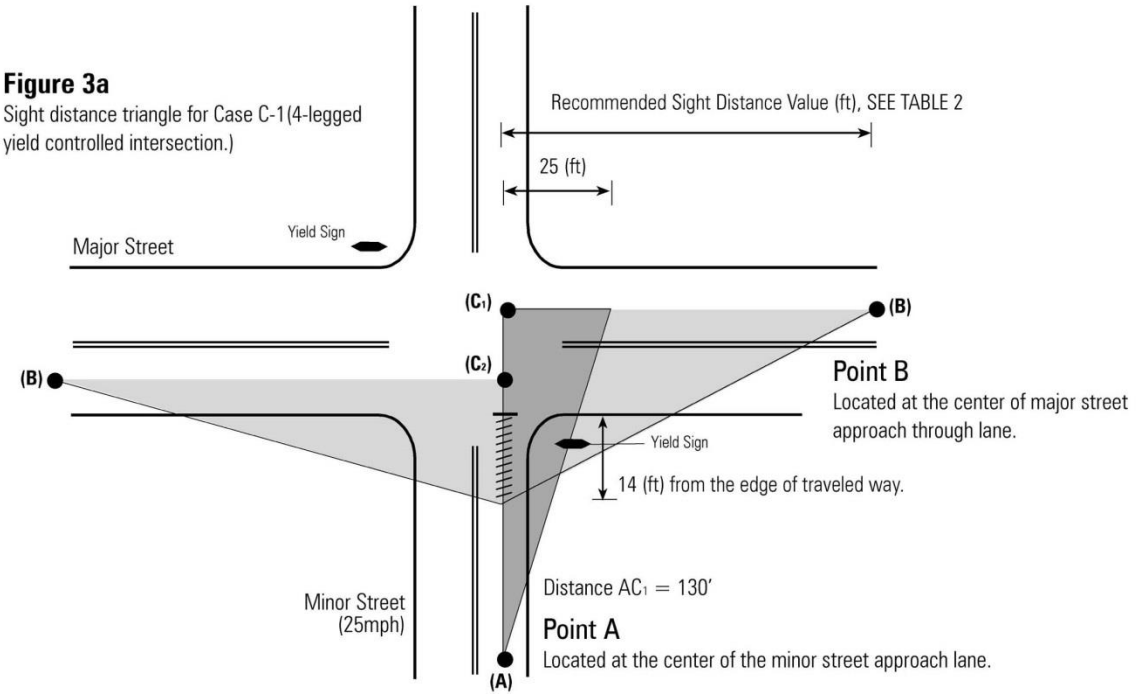
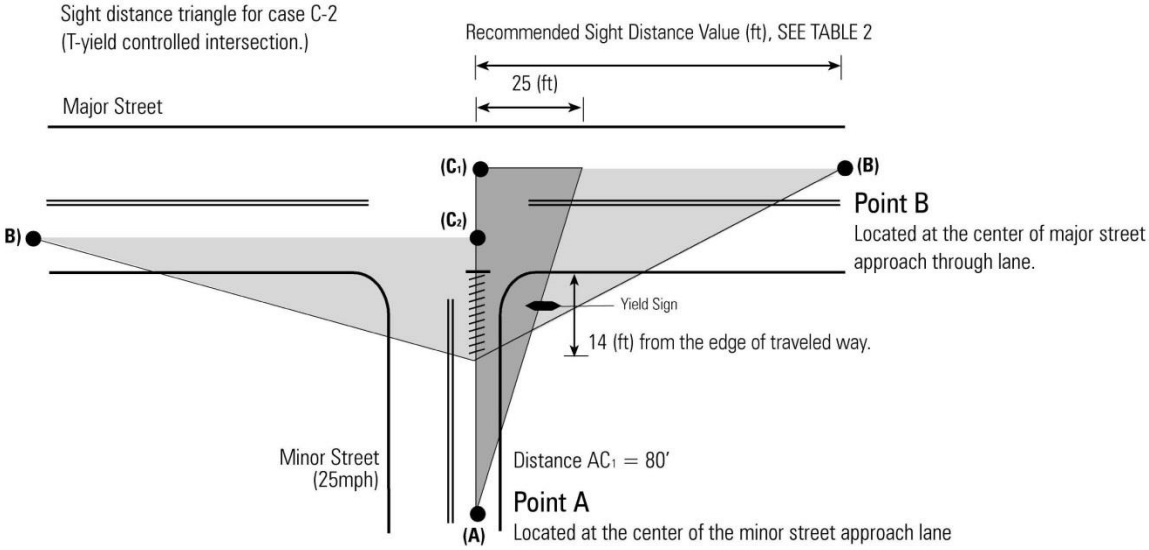


Figure 3b
Sight distance triangle for case C-2
(T-yield controlled intersection.)



Type D- Signalized Intersections and Signalized Driveways

At signalized intersections and signalized driveways, in order to turn right on red, drivers should be able to clearly see vehicles approaching from the left; the applicable sight distance triangle is the shaded area bounded by the A-B, B-C1, and A-C1 setback lines shown in Figure 2 on page 6. Sight distance (B-C1) values are summarized in Table 2 on page 2.

Type E1 through E4 – Driveways not Controlled by Traffic Signals

Driveways not controlled by traffic signals operate as Type B, Stop-Controlled Intersections; therefore, the applicable sight distance triangles are shown in Figure 2 on page 6. For driveways Type E1, Point A is located 10 ft from the edge of the major route's traveled way. For driveway Types E2 through E4, Point A is located 14 ft from the edge of the major route's traveled way. Sight distances values (B-C1, B-C2) are summarized in Table 2 on page 2.

Type F- Intersections and Driveways not Covered in Types A-E.

The sight distance triangle for intersections and driveways that do not fit any of the types previously described are to be analyzed on a case by case basis.